

USSN: 10/534,075
Attorney Docket No. P2002J113
Reply to Notice of Allowance of January 19, 2010
Date: February 19, 2010

Listing of Claims:

1-38. (Cancelled)

39. (Previously Presented) A process comprising:

(a) contacting one or more benzenopolycarboxylic acids or a mixture of one or more benzenopolycarboxylic acids with a source of hydrogen in the presence of a catalyst comprising one or more catalytically active metal sites located on a catalyst support, under hydrogenation conditions, whereby at least one of said one or more benzenopolycarboxylic acids or mixture of one or more benzenopolycarboxylic acids are hydrogenated to provide a product;

(b) recovering said product;

wherein at least one of said catalytically active metal sites has been obtained via the partial decomposition on said catalyst support of a complex of a Transition Group VIII metal and a compound selected from the group consisting of (i) amino acids and (ii) aliphatic amines comprising one or more hydroxyl groups, partial decomposition having been carried out such that new vibration bands appear in the infra red spectrum of the complex at between 2100-2200 cm^{-1} and (a) having been carried out in the presence of hydrogen or (b) being followed by treatment with hydrogen.

40. (Cancelled)

41. (Previously Presented) The process according to Claim 39, wherein said benzenopolycarboxylic acid is selected from the group consisting of phthalic acid, terephthalic acid, isophthalic acid, trimellitic acid, trimesic acid, hemimellitic acid and pyromellitic acid, and mixtures of two or more thereof.

42. (Previously Presented) The process according to Claim 39, wherein said benzenopolycarboxylic acid is selected from the group consisting monoalkyl and dialkyl esters of phthalic acid, terephthalic acid and isophthalic acid, monoalkyl, dialkyl and trialkyl esters of trimellitic acid, trimesic acid and hemimellitic acid, monoalkyl, dialkyl, trialkyl and tetraalkyl

USSN: 10/534,075

Attorney Docket No. P2002J113

Reply to Notice of Allowance of January 19, 2010

Date: February 19, 2010

esters of pyromellitic acid, where the alkyl groups can be linear or branched and each have from 3 to 18 carbon atoms, anhydrides of phthalic acid, trimellitic acid and hemimellitic acid, pyromellitic dianhydride, and mixtures of two or more thereof.

43. (Previously Presented) The process according to Claim 39, wherein said contacting in step (a) is carried out at a pressure of 25 to 300 bar.

44. (Previously Presented) The process according to Claim 39, wherein said contacting in step (a) is carried out at a pressure of 50 to 220 bar.

45. (Previously Presented) The process according to Claim 39, wherein the total metal dispersion of the hydrogenation catalyst is 45% or more and the metal dispersion relating to a strongly chemisorbed component of the total metal dispersion is 20% or greater

46. (Previously Presented) The process according to Claim 39, wherein said decomposition is undertaken under hydrogen.

47. (Previously Presented) The process according to Claim 39, wherein after decomposition the partially or fully decomposed organic complex is treated with a source of hydrogen.

48. (Previously Presented) The process according to Claim 39, wherein said decomposition is undertaken via calcination, and said calcination temperature is less than the temperature, as determined by TGA in air, at which total weight loss of the organic complex occurs.

49. (Previously Presented) The process according to Claim 48, wherein said calcination temperature is between 200 °C and the temperature at which total weight loss of the organic complex occurs.

50. (Cancelled)

USSN: 10/534,075

Attorney Docket No. P2002J113

Reply to Notice of Allowance of January 19, 2010

Date: February 19, 2010

51. (Previously Presented) The process according to Claim 39, wherein at least one of said support materials is one or more ordered mesoporous materials.

52. (Previously Presented) The process according to Claim 51, wherein at least one of said support materials are selected from the group consisting of MCM-41, MCM-48 and MCM-50.

53. (Previously Presented) The process according to Claim 39, wherein said Group VIII metal is selected from the group consisting of platinum, rhodium, palladium, cobalt, nickel , ruthenium and a mixture of two or more thereof.

54. (Currently Amended) A process for hydrogenating one or more benzenopolycarboxylic acids comprising:

(a) contacting one or more benzenopolycarboxylic acids with a source of hydrogen in the presence of a catalyst comprising one or more catalytically active metal sites located on a catalyst support, under hydrogenation conditions, whereby said one or more benzenopolycarboxylic acids are hydrogenated to provide a product;

(b) recovering said product;

wherein at least one of said catalytically active metal sites has been obtained via the partial decomposition on said catalyst support of a complex of a Transition Group VIII metal and a compound selected from the group consisting of (i) amino acids and (ii) aliphatic amines comprising one or more hydroxyl groups, partial decomposition having been carried out such that new vibration bands appear in the infra red spectrum of the complex at between 2100-2200 cm^{-1} and (a) having been carried out in the presence of hydrogen or (b) being followed by treatment with hydrogen;

wherein said Transition Group VIII metal is selected from the group consisting of platinum, rhodium, palladium, cobalt, nickel [[or]] , ruthenium and a mixture of two or more thereof; and

wherein at least one of said support materials are selected from the group consisting of silica, MCM-41, MCM-48 and MCM-50.

USSN: 10/534,075

Attorney Docket No. P2002J113

Reply to Notice of Allowance of January 19, 2010

Date: February 19, 2010

55. (Previously Presented) The process of claim 39, wherein the aliphatic amines comprises one or more hydroxyalkyl groups.

56. (Previously Presented) The process of claim 55, wherein the hydroxyalkyl groups are selected from the groups consisting of C₁ -C₅₀ -hydroxyalkyl groups, C₁ -C₈ -hydroxyalkyl groups, and C₁ -C₄ -hydroxyalkyl groups.

57. (Previously Presented) The process of claim 55, wherein the hydroxyalkyl groups are selected from one or more of the following groups: hydroxymethyl, 1-hydroxyethyl, 2-hydroxyethyl, 1-hydroxy-n-propyl, 2-hydroxy-n-propyl, 3-hydroxy-n-propyl, and 1-hydroxy-methyl-ethyl.

58. (Previously Presented) The process of claim 39, wherein the aliphatic amine comprises one or more mono-, di-, and tri-, substituted aliphatic hydroxyalkylamines.

59. (Previously Presented) The process of claim 39, wherein the aliphatic amine is selected from the group consisting of methanolamine, di-methanolamine, tri-methanolamine, ethanolamine, di-ethanolamine, tri-ethanolamine, butanolamine, di-butanolamine, tri-butanolamine, propanolamine, di-propanolamine, and tri-propanolamine.

60. (Previously Presented) The process of claim 54, wherein the aliphatic amines comprises one or more hydroxyalkyl groups.

61. (Previously Presented) The process of claim 60, wherein the hydroxyalkyl groups are selected from the groups consisting of C₁ -C₅₀ -hydroxyalkyl groups, C₁ -C₈ -hydroxyalkyl groups, and C₁ -C₄ -hydroxyalkyl groups.

62. (Previously Presented) The process of claim 60, wherein the hydroxyalkyl groups are selected from one or more of the following groups: hydroxymethyl, 1-hydroxyethyl, 2-

USSN: 10/534,075

Attorney Docket No. P2002J113

Reply to Notice of Allowance of January 19, 2010

Date: February 19, 2010

hydroxyethyl, 1-hydroxy-n-propyl, 2-hydroxy-n-propyl, 3-hydroxy-n-propyl, and 1-hydroxy-methyl-ethyl.

63. (Previously Presented) The process of claim 54, wherein the aliphatic amine comprises one or more mono-, di-, and tri-, substituted aliphatic hydroxyalkylamines.

64. (Previously Presented) The process of claim 54, wherein the aliphatic amine is selected from the group consisting of methanolamine, di-methanolamine, tri-methanolamine, ethanolamine, di-ethanolamine, tri-ethanolamine, butanolamine, di-butanolamine, tri-butanolamine, propanolamine, di-propanolamine, and tri-propanolamine.

65. (Previously Presented) A process comprising:

(a) contacting one or more benzenopolycarboxylic acids or a mixture of one or more benzenopolycarboxylic acids with a source of hydrogen in the presence of a catalyst comprising one or more catalytically active metal sites located on a catalyst support, under hydrogenation conditions, whereby at least one of said one or more benzenopolycarboxylic acids or a mixture of one or more benzenopolycarboxylic acids are hydrogenated to provide a product;

(b) recovering said product;

wherein at least one of said catalytically active metal sites has been obtained via the partial decomposition on said catalyst support of a complex of a Transition Group VIII metal and a compound selected from the group consisting of (i) amino acids and (ii) a compound represented by the formula:



wherein R¹ and R² are independently hydrogen, or R¹, R² and R³ independently are one or more of the following groups: C₁ -C₅₀ -alkyl, C₃ -C₅₀ -cycloalkyl, aromatic, C₁ -C₅₀ -alkyl substituted aromatic, C₁ -C₅₀ -hydroxyalkyl, amino- and/or hydroxyl-substituted C₁ -C₅₀ -alkyl, C₂ -C₅₀ -alkoxyalkyl, C₃ -C₅₀ -dialkylaminoalkyl, C₂ -C₅₀ -alkylaminoalkyl, C₁ -C₅₀ -alkyl substituted heterocyclic and aromatic heterocyclic compounds, and C₁ -C₅₀ -alkylene moieties substituted

USSN: 10/534,075
Attorney Docket No. P2002J113
Reply to Notice of Allowance of January 19, 2010
Date: February 19, 2010

with one or more aromatic groups, optionally, R¹ and R² may form, with the nitrogen atom, a nitrogen-containing heterocycle, aromatic heterocycle, alkyl substituted heterocycle, or alkyl substituted aromatic heterocycle;

partial decomposition having been carried out such that new vibration bands appear in the infrared spectrum of the complex at between 2100-2200 cm⁻¹ and (a) having been carried out in the presence of hydrogen or (b) being followed by treatment with hydrogen.

66. (Previously Presented) The process of claim 65, wherein said Transition Group VIII metal is selected from the group consisting of platinum, rhodium, palladium, cobalt, nickel, ruthenium and a mixture of two or more thereof.

67. (Previously Presented) The process of claim 66, wherein at least one of said support materials are selected from the group consisting of MCM-41, MCM-48 and MCM-50.

68. (New) The process of claim 39, wherein the catalyst support comprises silica.

69. (New) The process of claim 68, wherein the silica is amorphous.

70. (New) The process of claim 65, wherein the catalyst support comprises silica.

71. (New) The process of claim 70, wherein the silica is amorphous.

72. (New) The process of claim 54, wherein the silica is amorphous.